

KEYBOARD AND MOUSE OF HANDHELD DIGITAL DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of or priority to the following applications:

[0002] China application No. CN 201210291364.0, filed on Aug. 9, 2012, entitled “Keyboard of Cellular Phone”;

[0003] China application No. CN 201220724909.8, filed on Dec. 24, 2012, entitled “Keyboard and Mouse of Cellular Phone”;

[0004] PCT application No. PCT/CN2013/075887, filed on May 20, 2013, entitled “Keyboard and Mouse of Cellular Phone”;

[0005] China application No. CN 201510861828.0, filed on Nov. 30, 2015, entitled “A method realizing a plurality of keys/buttons in a multi-touch pad, which positions are determined dynamically and passively”;

[0006] PCT application No. PCT/CN2016/070222, filed on Jan. 6, 2016, entitled “A method realizing a plurality of keys/buttons which positions are determined dynamically and passively”;

[0007] U.S. application Ser. No. 15/149,074, filed on May 6, 2016, entitled “A method realizing a plurality of keys/buttons which positions are determined dynamically and passively”.

[0008] The above-identified applications are incorporated here by reference in entirety or part.

TECHNICAL FIELD

[0009] A keyboard and mouse solution is used for handheld digital devices (such as cellular phones, tablets, eBooks, electronic dictionaries, learning machines, and handheld control devices etc. A handheld digital device is hereinafter referred to as a device). For ease of description, cellular phones are taken as examples to explain and illustrate handheld digital devices with small size, and tablets are taken as examples to explain and illustrate handheld digital devices with large size. Due to the symmetry of one's hands, where the solution is explained and illustrated by means of left-right hands below, it can also be realized by means of right-left hands in turn, so unless it is necessary, explanation and illustration are no longer given by means of right-left hands. This keyboard and mouse solution is hereinafter referred to as the solution.

BACKGROUND ART

[0010] Currently, (1) There are three main kinds of cellular phone keyboard solutions: ① A dialing keyboard plus additional control and edit keys, the keys of which are too few to meet the requirements of increasingly powerful cellular phone applications; ② A smaller version of a PC keyboard. Because of the small size of cellular phones, the keys of this type of keyboard is too crowded to be convenient to use; ③ A QWERT keyboard is a simplified version of a PC keyboard which only keep the letter keys. Even though the keys reduce in quantity, the QWERT keyboard cannot yet be compatible with cellular phones with small size, and the keys are still crowded to be inconvenient to use. (2) A tablet uses a soft QWERT keyboard basically. Even though a single key is big enough, the keys of each row can be up to 10 at most, and moreover the keyboard is not a hard

one, so a user cannot position his/her fingers easily and touch type at a high speed. (3) Neither cellular phones nor tablets have a device like a mouse.

[0011] Anyway, the main technical problems of keyboard and mouse of a handheld digital device are currently: ① A user cannot use most of the fingers of the two hands simultaneously with a keyboard. In most cases, the user uses only one finger of a single hand, at most the two thumbs of the two hands; ② The keys of the keyboard are small either in size or in quantity, or the keys of each row are too much (refers to a QWERT keyboard of a tablet), so the keyboard is not fit for touch typing at a high speed; ③ There is no good hand feel because of the soft keyboard used by most of handheld digital devices. ④ There is not any powerful tool like a mouse, and moreover touch operations often result in wrong actions; ⑤ In the absence of a mouse, there is not any accurate positioning tool like a mouse pointer, and many mature PC applications such as word processing software cannot be effectively used with a handheld digital device, and some PC applications such as senior drawing software maybe cannot be transferred to a handheld digital device forever; ⑥ In the absence of appropriate control keys, no shortcuts can be used like a PC keyboard; ⑦ Taking no account of the compatibility with a PC keyboard, there will be troubles in the PC application's transference to a handheld digital device when the device developments to become a personal computing center in the future.

[0012] The followings to the end of this section are added newly in this continuation-in-part application.

[0013] A US application US2002/0163504 disclosed a keyboard for a hand-held device comprising multiple keys on the face (“face-keys”) of the device and one or more buttons on the side (“side-buttons”) of the device. A user types a character (or invokes a function) by pressing one of the face-keys using a finger on the hand that is not holding the device while simultaneously holding in combinations of the side-buttons with fingers on the hand that is holding the device. Pressing a face-key without holding in any of the side-keys produces a given character (or function). Pressing the same face-key while simultaneously holding in a given combination of the side-keys can result in a different character (or function).

[0014] This invention is the most similar to the present invention, but the side-buttons (keys) are operated via a popular and traditional method, it is not user-friendly. The side-buttons are not holding positions of the hand-held device and the fingers operating the side-buttons hang in the air when not in operation. This results in operating the side-buttons very uncomfortably and un-easily and holding the hand-held device unsafely and un-firmly.

BRIEF SUMMARY OF THE INVENTION

[0015] In order to solve the technical problems mentioned above, the technical solution of this invention is: (1) On the side(s) (including the back, top side and the other locations) of a handheld digital device or main keyboard of the device, we configure additional keyboard control keys (hereinafter referred to as side-keys) which are operated by left hand. Besides the conventional PC keyboard control keys: Shift, Ctrl and Alt, 4 new control keys named as Fvrt, Eng, Num and Ext are configured, which are shown as 3 in FIGS. 1 and 4 in FIG. 3. Fvrt is short for favorite and used to enter a user's mother tongue or the common second language of an English user. Eng is short for English and used to enter